

***PROVISION OF DIGITAL LIBRARIES IN ENHANCING
COMPETITIVE INTELLIGENCE CAPABILITIES IN OPEN
DISTANCE LEARNING (ODL) ENVIRONMENT***

CHEW BEE LENG

A Master's Project submitted in partial fulfillment of the
requirements for the degree of Master of Information Science
(Competitive Intelligence)

Faculty of Information Technology & Multimedia Communication
Open University Malaysia

2011

TABLE OF CONTENTS		Page
ABSTRACT		v
ABSTRAK		vi
ACKNOWLEDGEMENT		vii
DECLARATION		viii
PLAGIARISM STATEMENT		ix
LIST OF TABLES		x
LIST OF FIGURES		xi
LIST OF ABBREVIATIONS		xii
CHAPTER 1.0	INTRODUCTION	1
1.1	Background to the study	1
1.2	Problem statement	4
1.3	Objectives of the study	5
1.4	Research question	5
1.5	Research hypothesis	5
1.6	Significance of the study	5
1.7	Assumption and limitations of the study	6
1.8	Possible outcomes and contributions	7
1.9	Definition of terms	8
1.10	Conclusion	10
CHAPTER 2.0	REVIEW OF THE LITERATURE	11
2.1	Introduction	11
2.2	Overview of ODL	13
	2.2.1 Asia region trends	14
	2.2.2 Purpose of ODL	15
	2.2.3 Characteristics of ODL	15
	2.2.4 Economics of ODL	16
	2.2.5 Challenges and opportunities for ODL	17
2.3	What is competitive intelligence?	19
	2.3.1 Competitive intelligence cycle	19
2.4	Key intelligence topics in ODL	24
2.5	Building capacities to meet ODL challenges	25
2.6	Provision of digital libraries to build ODL capacities	26
2.7	Conclusion	28
CHAPTER 3.0	RESEARCH METHODOLOGY	29
3.1	Introduction	29
3.2	Research site	31
3.3	Sample	32
3.4	Research purpose	33
3.5	Instrumentation (Survey design)	34
3.6	Data collection procedures	37
3.7	Data analysis framework	38
3.8	Conclusion	38

TABLE OF CONTENTS		<i>Page</i>
CHAPTER 4.0	DATA ANALYSIS AND RESULTS	39
4.1	Introduction	39
4.2	Discussion of results	39
	4.2.1 Response rate and respondents profile	40
	4.2.2 Key competitive needs and marketplace information	43
	4.2.3 Relationship with technology mining techniques and website information	50
	4.2.4 Any other comments	52
4.3	Conclusion	53
CHAPTER 5.0	FINDINGS, DISCUSSION AND CONCLUSION	54
5.1	Introduction	54
5.2	Summary of findings	54
5.3	Discussion of findings	56
5.4	Digital libraries of educational resources and services – Capabilities identified	61
	5.4.1 Open Educational Resources (OER)	61
	5.4.2 Learning Objects (LO)	63
	5.4.3 Podcasting	64
	5.4.4 E-Portfolio	66
	5.4.5 RSS Feeds and Social bookmark	67
	5.4.6 Selective Dissemination Information (SDI)	68
	5.4.7 Advanced search engines	68
	5.4.8 Marketplace updates	69
5.5	Limitations	73
5.6	Implications of the study	74
5.7	Recommendations	74
5.8	Conclusion	75
	REFERENCES	76
	APPENDICES	
	APPENDIX A – List of 20 largest universities by enrollment	81
	APPENDIX B (i) – Introduction survey letter to respondent	82
	APPENDIX B (ii) – Survey Questionnaire	83
	APPENDIX C – SPSS Data Analysis results	87
	APPENDIX D – Data Coding Editor View	95
	APPENDIX E – Variable View Editor	97

ABSTRACT

Competition has become a driving force for innovation and entrepreneurship. Competitive intelligence is a legitimate and necessary activity to increase institution's intelligence regardless of what industry it is in. In the academia industry the open distance learning (ODL) education has been developing rapidly with national characteristics in different parts of the world. To remain competitive in the light of challenging economic environment, open distance learning (ODL) institution needs to capitalize on information and communication technology as deployment technology. The purpose of this study is to investigate the areas of intelligence practices (such as awareness, planning, collection, process and analysis) of the various operations and support services units of one of the open distance learning (ODL) institution in Malaysia. Due to privacy reason and to avoid any possible conflict of interest, the name of the institution could not be disclosed. The researcher aims to identify, discuss and assess the relevant parameters to gauge the knowledge sharing culture and competitive needs of the institution. A primary survey was conducted using a semi-structured questionnaire administered to the senior and middle-level management group of the institution's various operations and support services units. The findings and implications of the study are discussed. In line with the explosion of information technology innovations, this study explored on the provision of digital libraries to facilitate the storage, organization and knowledge dissemination of diverse information as a productive way to assist the institution's competitive business. Few strategic ideas deemed as potential competitive capabilities are proposed as recommendations.

JANUARY 2011

ABSTRAK

Persaingan telah menjadi tenaga penggerak kepada inovasi dan keusahawanan. Perisikan dayasaing adalah satu aktiviti sah yang amat diperlukan untuk meningkatkan dayasaing sesebuah institusi tanpa mengira bidang yang diceburi. Di beberapa pelusuk negara, industri pendidikan khususnya bagi pendidikan jarak jauh, ia telah membangun dengan begitu pesatnya lengkap dengan ciri-cirinya yang tersendiri. Demi untuk terus bersaing di dalam persekitaran yang amat mencabar dewasa ini, institusi pendidikan jarak jauh haruslah memanfaatkan penggunaan teknologi komunikasi dan informasi sebagai teknologi penggerak. Tajuk utama kajian ini ialah “Peruntukan perpustakaan digital meninggikan kemampuan perisikan dayasaing pendidikan jarak jauh”. Kajian ini dilaksanakan bertujuan untuk mengkaji sejauh mana aktiviti dayasaing seperti perancangan, pengumpulan maklumat, kesedaran dan analisis mengenai pesaing-pesaing dan persekitarannya, dipraktikkan di dalam unit-unit sokongan pentadbiran salah sebuah institusi pendidikan jarak jauh di Malaysia. Nama institusi yang dipilih sebagai contoh kajian dirahsiakan atas sebab-sebab tertentu demi untuk mengelakkan sebarang konflik kelak. Objektif utama kajian ini adalah untuk mengenalpasti, membincang dan menilai parameter-parameter yang berkaitan dengan budaya perkongsian maklumat dan mengenalpasti keperluan utama dayasaing institusi tersebut. Satu kaji selidik telah dijalankan menggunakan kaedah temuduga ke atas kakitangan atasan dari pelbagai unit pentadbiran. Hasil penemuan dari analisis kajian dan implikasinya telah dibincangkan. Selaras dengan peledakan inovasi teknologi informasi, kajian ini telah menyarankan penggunaan perpustakaan digital sebagai satu strategi untuk menyelaraskan dan menyalurkan pengetahuan yang memberi nilai dayasaing kepada institusi. Beberapa ide yang dianggap strategik dan berpotensi telah dicadangkan.

JANUARY 2011

ACKNOWLEDGEMENT

This research study is made possible through the contribution of many individuals. Above all I would like to gratefully acknowledge the assistance, support and insightful guidance and feedback provided by my Project Supervisor, Dr Ariff Syah Juhari throughout the journey in completing this research study.

I would also like to take this opportunity to extend my sincere thanks for the continuous support received from my colleagues, course mates and my family members. Their criticism and feedback were invaluable to this research. I thank all participants of the research site for contributing their time during the interview survey which was a fulfilling and an enriched experience. Thank you.

DECLARATION

Name : Chew Bee Leng

Matric Number : CGS00386813

I hereby declare that this project is the result of my own work, except for quotations and summaries which have been duly acknowledged.



Signature :

Date : 17 April 2011

PLAGIARISM STATEMENT

Recognising that students have an ethical and moral obligation to ensure that all work that they submit in their name is, indeed, their own and free of plagiarism, I have exercised caution throughout the writing process. Therefore, I have scanned my research report through a web-based plagiarism detection tool, Turnitin (<http://www.turnitin.com>). The Originality Report received from Turnitin indicated that the work was, indeed original and that I had not plagiarized any part of it. Thus, I am submitting this research report as my own original work.

Declaration made by :



.....

Signature

Name : Chew Bee Leng

Matriks No. : CGS00386813

Date checked : 17 April 2011

LIST OF TABLES

Table 2.3.1	Key elements of CI management	23
Table 3.3	Survey samples (Top and middle level management)	33
Table 3.5	Questionnaire structure	35
Table 4.2.1a	Departmental breakdown of respondents (Senior management level)	40
Table 4.2.1b	Total respondents by age group and gender	41
Table 4.2.1c	Total respondents by education background	41
Table 4.2.1d	Total respondents by occupation category	42
Table 4.2.1e	Employees group size by department	42
Table 4.2.2	Cronbach's alpha for identifying key competitive needs statements	44
Table 4.2.2.1	Mean of responses to statement on strategy and action plan	45
Table 4.2.2.2	Mean of responses and Cronbach's alpha statement on collection of primary information	45
Table 4.2.2.3	Mean of responses to statements on management of intelligent information	46
Table 4.2.2.4	Mean of responses to statement on analysis	47
Table 4.2.2.5	Mean of responses to statement on planning/focus	48
Table 4.2.2.6a	Mean of responses to statement on understanding the need to have digital libraries	48
Table 4.2.2.6b	Chi-square tests	49
Table 4.2.3.1	Mean scores and standard deviation values to statements on website information mining techniques	51
Table 4.2.3.2	Mean scores and standard deviation to statements on search engine techniques	52
Table 4.2.4	Suggestions on how intelligent information can be collated for decision-making	52
Table 5.4.1	Useful OER websites	62
Table 2.2.1	List of 20 largest universities in Asia by enrollment	82

LIST OF FIGURES

Figure 2.3.1	Competitive intelligence cycle	22
Figure 3.1	Provision of digital libraries variables	31
Figure 4.2.2.6	Bar chart of cross-tabulated variables	50
Figure 5.4.7	Carrot2 search engine interface	69
Figure 5.4	CI capabilities framework on the provision of digital libraries	72
Figure 5.4.4	Percentage of Malaysia population with tertiary education (1991-2008)	65

LIST OF ABBREVIATIONS

API	Application Programme Interface
ARI	Accounting Research Institute
BIDE	Bangladesh Institute of Distance Education
CC	Creative Commons
CDR	Centre for Drug Research
CEO	Chief Executive Officer
CI	Competitive intelligence
COL	Commonwealth of Learning
HiCoE	Higher Institutions' Centres of Excellent
HKOU	Hong Kong Open University
IBS	Institute of Bioscience
ICT	Information and communication technology
IGNOU	Indira Gandhi Open University
IT	Information technology
KIT	Key Intelligence Topics
KNOU	Korea National Open University
MDG	Millennium Development Goal
MOHE	Malaysia Ministry of Higher Education
OCW	OpenCourseWare
ODL	Open distance learning
OER	Open Educational Resources
OUM	Open University Malaysia
RSS	Really Simple Syndication / Rich Site Summary
RTVU	Radio and TV University, China
SCIP	Society of Competitive Intelligence Professionals
SDI	Selective Dissemination Information
SPSS	Statistical Package for Social Sciences
STOU	Sukhothai Thammathirat Open University
SWOT	Strengths, Weaknesses, Opportunities, Threats
UIA	Univesity of the Air, Japan
UiTM	Universiti Teknologi MARA
UKM	Universiti Kebangsaan Malaysia
UMBI	UKM Medical Biology Institute
UMPEDAC	UM Centre of Research for Power Electronics, Drives, Automation & Control
UPLB	University of the Philippines Los Banos
USM	University Science Malaysia
VUSSC	The Virtual University for Small States of the Commonwealth

CHAPTER 1.0 INTRODUCTION

1.1 Background to the study

Over the past two decades, distance education has been developing rapidly with national characteristics in different parts of the world. The emergence of new educational technologies has triggered a revolutionary process (Reddy, 1988). There are over seventy open universities and large numbers of other distance education providers are located in Asia, which is a cultural pot of diversity. This proves the success of distance education as a concept amongst the governments and the public in general in the region (Latchem & Jung, 2010). The emergence of open distance learning institutions is due to lack of places in public institutions. Open distance learning is a very idealistic concept which in reality is difficult to implement (Belawati & Baggaley, 2010).

Open distance learning (ODL) is a promising and practical strategy to address the challenge of widening access thus increasing participation in higher education. It is increasingly being seen as an educational delivery model which is cost-effective without sacrificing quality (Pityana, 2009). Distance education learning is technology driven. Technology means not just bandwidth but hardware platforms, software, processes and applications including mobile telephony, necessary for effective student and academic management and learner support.

According to Davis (1996) open learning is regarded as something relatively new, usually related to “distance learning”, therefore limited in-depth analysis was conducted in management development of open distance learning. Information professionals can act as knowledge management centers to provide competitive intelligence services in business (Parker, 2005). Distance learning has been made possible by technological breakthroughs such as the development of the web, and universities have promoted it because distance learning programs have increasingly played an important role in the financial success of the university (Lukasiewicz, 2007).

This research study has outlined the range of typical operations and support services units of an ODL institution and attempted to identify the key intelligence practices of the institution. In line with the explosion of information technology (IT) innovations, the provision of digital libraries was suggested to facilitate the storage, organization of diverse information gathered to assist the institution’s business. Based on the research findings, the researcher has recommended few competitive intelligence capabilities for the digital libraries as the content. This research study has generally looked on the operation of an ODL institution which covers a wide range of operations and support services units’ activities which are considered as the backbone and knowledge provider to the business of the institution. Traditionally, such activities involve and require a large number of staff to manage the activities. ODL institution will always find ways to “do more with less” (Wong, Lee & Wu, 2006). In general practice, ODL institutions at tertiary level must in one form or another provide a combination of the following services to support learners in order to sustain and be competitive in its business:

- a. marketing management
- b. learning support system
- c. student admission and registration
- d. financial management
- e. human resources management
- f. learning and library services
- g. student record management

The above operational systems are needed to support the continuous cycle of services to users. Therefore continuous adjustment to new and increasing operational demands and innovation are necessary. ODL requires sound management and leadership with clever strategist. As the environment for ODL changes, there will be mounting pressure on institution to respond to those changes in order to remain competitive at a rapid rate (Dhanarajan, 2009).

Digital libraries are selected as the focus of the study mainly because digital libraries can create a new searching environment which the researcher believed it is still lacking in the provision of competitive intelligence information via digital libraries. This study will hopefully provide insight of what are the competitive intelligence capabilities that can serve as part of the intelligence deliverables. With such a provision, it is hope that digital libraries can support the operations of the ODL institution.

1.2 Problem statement

In view of the diversities in the open distance learning (ODL) mode of operations, the workforce broken down to units can no longer be homogeneous as they are in a conventional institution (Ojo & Olakulein, 2006). To remain competitive in the light of challenging economic environment, open distance learning (ODL) institution needs to implement learner-centred approach in teaching and learning and capitalize on information and communication technology as deployment technology. Open distance learning (ODL) institution regardless of size and performance must have the means to assess the external environment to maintain competitive edge. Competitive intelligence represents one of the most important pieces in strategic management of organizations in order to sustain and enhance competitive advantage over competitors. Ferguson & Wooldridge (1997) argued that we are currently witnessing a crossover from the development of prototypical system to a widespread commercial use of advanced digital libraries. The most difficulties encountered by users on searching for content from the World Wide Web is the well known “information overload” problem. People are frequently overwhelmed by the sheer amount of information available, making it hard for them to filter out junk and irrelevancies and focus on what is important. According to Belawati & Baggaley (2010) many educational institutions in Asia lack the facilities and human resources to utilize the Internet to its fullest content. These gaps lead to an attempt of the researcher to answer the following research question:

What are the competitive intelligence capabilities that can be provided through digital libraries that can support the open distance learning business?

1.3 Objectives of the study

This research study plans to address the following objectives:

- (i) To identify the management key intelligence needs in order to sustain competitive edge
- (ii) To analyze the information on the internal/external environment which engage in competitor intelligence activities
- (iii) To propose strategic ideas that can address opportunities and threats via the provision of the intelligence resources through digital libraries

1.4 Research question

This study attempts to answer the following research question:

What are the competitive intelligence capabilities that can be provided through digital libraries that can support the open distance learning business?

1.5 Research hypothesis

Based from the research objectives and research question, the researcher develops the following hypothesis to this research.

H1 : Digital libraries can be a consistent source to engage, gather and analyze competitor intelligence information

1.6 Significance of the study

This research study can contribute to the field of ODL institution and competitive intelligence. It can provide the following values:

- a. Ability to gather information on key intelligence needs and perform analysis and feedback to decision-makers on various aspects
- b. Assist institution in competing more effectively with competitors
- c. Provide opportunity to introduce new services to an open distance learning (ODL) institution
- d. React to the challenge that open distance learning (ODL) information professionals can embrace opportunities to expand its services

1.7 Assumption and limitations of the study

This research study is conducted with an assumption that respondent will answer only what is required from the questionnaire, with comments to be provided on the final open-ended question of the questionnaire. The name of the research site could not be disclosed due to privacy reasons and to avoid any possible conflict of interest that may exist. The research site does not hold any merits towards the researcher's academic contribution. The opinion and conclusions expressed in this report are purely of the researcher and do not represent the views of the research site and the staff. The research findings are for educational purpose only.

Like any other piece of research, shortcomings do exist in this research study. The limitations that researcher encountered are as follows:

- i. The sample size of the research might be small as it depends on how positive participants are willing to provide their feedback.

- ii. The focus group respondents are limited to staff from the Headquarters of the research site. It does not extend to the Regional Offices of the research site. The Regional Offices basically act as learning, counseling and registration centres - an interface between the research site and students.
- iii. Respondents may not have the basic understanding of what is competitive intelligence as a process to obtain competitive advantage and enhancing organization ability. The layman might not understand some of the issues asked in the survey.
- iv. Respondents might not be very honest in their answers.
- v. Researcher was unable able to make comparison with other ODLs in Malaysia on their key intelligence needs due to lack of contact and information.
- vi. The collection of data took place on a certain period of research study time – mid-December 2010 to 15 January 2011.
- vii. Being a first timer, researcher lacked of the experience in conducting research and analysis and evaluation of data collected. The analysis information might not be comprehensive.

1.8 Possible outcomes and contributions

The researcher has identified the following possible benefits from recommending the provision of digital libraries at the research site:

- As digital libraries play the intermediary services, it can increase the range of possible services that are crucial to the institution.

- It enhanced the institution's competitiveness by maximizing the efficiency of using internal and external linkages through new found information.
- It enabled the sharing of ideas and knowledge inside the institution in order to develop new ideas/knowledge or to integrate existing knowledge into the institution.
- It provided a better support system for strategic decision making process.
- It revealed opportunities and threats by the early warning signals identified.

1.9 Definition of terms

The following are definitions to the primary terms used in this research study to ensure common understanding of the research:

Open distance learning (ODL) reflects the fact that all or most of the teaching is conducted by someone removed in time and space from the learner, and that the mission aims to include greater dimensions of openness and flexibility, whether in term of access, curriculum or other elements of structure (Moore & Tait, 2002). Sir John Daniel (2004) the President and CEO of Commonwealth of Learning (COL)¹ described *open learning* as policies and practices that permit entry to learning with no or minimal barriers of age, gender or time while recognizing prior learning. He mentioned that *distance learning* is the delivery of learning or training to learners who are separated mostly by time and space, from those who are teaching and training. In the following text of this report, the abbreviation ODL will be used to represent *open distance learning*.

¹ COL is the world's only inter-governmental organization created in 1989 by Commonwealth Heads of Government to encourage the development and sharing of distance education knowledge, resources and technologies. COL is financially supported by Commonwealth governments on a voluntary basis (Belawati & Baggaley, 2010, p.27).

Competitive intelligence (CI) as defined by the Society of Competitive Intelligence Professionals (SCIP) is a systematic and ethical process for gathering and analyzing information about the competition's activities and general business trends to further a business' own goals (Groom & David, 2001). According to Brody (2008), "CI is a systematic and ethical program for gathering, analyzing and managing information that can affect a company's plans decisions and operations."

There are two definitions of *digital libraries* where one focus on the access and retrieval of digital content and the other focuses on the collection, organization and services aspects of digital libraries. As Brogman (1999) states, a digital library is a combination of a service, an architecture, a set of information resources, databases of text, numbers, graphics, sound, videos, etc and a set of tools and capabilities to locate, retrieve and utilize the information resources available. In this research study, the term *digital libraries* refer to a provision of collection and access of competitive information to help the key players to use the information to increase their competitive edge in their daily operation work. In the provision of the digital libraries, the provision of online databases, e-journals, e-books and other digitized collection was not considered. These were categorized as resources.

Key intelligence topics (KIT) refers an organization's intelligence needs which can be generally assigned to one of the three functional categories which are strategic decisions and action, early-warning topics and description of the key players in the marketplace

(Herring, 1999). KIT usually include relationships, driving forces, objectives and intentions, strategies and tactics (Myburgh, 2004).

The term *provision* as defined by *Oxford English Dictionary Online* refers to the action or an action of providing, preparing or arranging in advance the fact or condition of being prepared or made ready beforehand.

The term *capabilities* as defined by *TheFreeDictionary* refers to the quality of being capable, a characteristic that may be developed.

1.10 Conclusion

This research study has focused on the provision of digital libraries based on providing competitive intelligence capabilities which can serve users and the information needs of the target community of the research site in order to enhance institution's competitive intelligence. The next chapter presented the literature reviewed for this research study.

REFERENCES

- Adams, A. & Blandford, A. (2005). Digital libraries' support for the user's 'information journey'. JDCL '05 June 7-11, 2005, Denver, Colorado, USA.
- Anica-Popa, I. & Cucui, G. (2009). A framework for enhancing competitive intelligence capabilities using decision support system based on web mining techniques. *International Journal of Computers, Communication & Control* 4(4), 326-334.
- Anon. (2010). Using analytics to achieve high performance. *Harvard Business Review* July-August, 164.
- Baggaley, J. & Belawati, T. Eds. (2010). Policy and practice in Asian distance education. New Delhi : SAGE Publications India Pvt Ltd, 260 p.
- Baggaley, J. & Belawati, T. Eds. (2010b). Distance education technologies in Asia. Canada : International Development Research Centre, 270 p.
- Barrett, B. F. D., Grover, V. I., Janowski, T., van Lavieren, H., Ojo, A & Schmidt, P. (2009). Challenges in the adoption and use of OpenCourseWare: experience of the United Nations University. *Open Learning: The Journal of Open and Distance Learning*, 24(1), 31-38.
- Barrett, S. E. (2010). Competitive intelligence: significance in higher education. *World Future Review* August-September, 26-30.
- Bissell, A. N. (2009). Permission granted: open licensing for educational resources. *Open Learning* 24(1), 97-106.
- Brewer, A., Ding, W., Hahn, K. & Komlodt, A. (1996). The role of intermediary services in emerging digital libraries. Proceedings of the First ACM International Conference on Digital Libraries (Bethesda, Maryland, USA), p.29-35.
- Brody, R. (2008). Issues in defining competitive intelligence: an exploration. *Journal of Competitive Intelligence & Management* 4(3), 3-15.
- Brogman, C. L. (1999). What are digital libraries? competing visions. *Information Processing and Management* 44(5), 66-67.
- Chen, H., Chau, M. & Zeng, D. (2002). CI spider: a tool for competitive intelligence on the web. *Decision Support Systems* 34, 1-17.
- Chong, E. (2011). Uncovering the risks of social networking applications in the workplace. *Malaysian Business (mb-e)* 16 March, 7-8.
- D'Antoni, S. (2008). Open educational resources: the way forward. Paris : UNESCO.

- D'Aquin, M., Motta, E., Sabou, M., Angeletou, S., Gridinoc, L., Lopez, V. & Guidi, D. (2008). Toward a new generation of semantic web applications. *IEEE Intelligent Systems* May/June 2008, 20-28.
- Daniel, J. (2004). Building capacity in open distance learning. Paper presented at UNESCO/OECD Australia Forum on Trade in Educational Services (12 October). Retrieved from [http://www.col.org/resources/speeches/2004presentations/..](http://www.col.org/resources/speeches/2004presentations/)
- Davis, H. J. (1996). A review of open distance learning within management development. *Journal of Management Development* 15(4), 20-34.
- Dey, N. C. & Sarkar, P. (2009). RSS feeds and its application in library services. 7th International CALIBER-2009 (25-27 February 2009, University of Puducherry, Pondicherry, India). Retrieved from <http://www.inflibnet.ac.in/caliber2009/CaliberPDF/42.pdf>
- Dhanarajan, G. (2008). Open distance learning in the Asia-Pacific region: a snapshot. Paper presented at Asia-Pacific Sub-regional Preparatory Conference for the 2009 World Conference on Higher Education (24-26 September, Macao, P R China).
- Dhanarajan, G. (2009). Open distance learning: managing change – building capacity. Paper presented at International Summit on Open and Distance Education (16-17 October 2009, Beijing, China).
- Dou, H. J. & Manullang, S. D. (2008). The intelligent region and corporation (Chapter II). In *Competitive intelligence technology watch and regional development*. Jakarta : MUC Publishing, 201 p.
- Fatt, C. C. (2007). Libraries and librarians - what next? *Library Management* 28(3), 112-124.
- Ferguson, I. A. & Wooldridge, M. J. (1997). Paying their way: commercial digital libraries for the 21st century. *D-Lib Magazine* June 1997. Retrieved from <http://dlib.anu.edu.au/dlib/june97/zuno/06ferguson.html> (assessed 15 October 2010).
- Fuld, L. M. (2005). The new competitor intelligence: the complete resource for finding, analyzing, and using information about your competitors. New York : John Wiley & Sons, Inc, 482 p.
- Groom, J. R. & David, F. R. (2001). Competitive intelligence activity among small firms. *SAM Advanced Management Journal* Winter 2001, 12-20.
- Gross, M. (2000). Competitive intelligence: a librarian's empirical approach. *Searcher* 8(8), 70-76.

- Hall, D. (2009). Whisper it: administration can be useful, innovative and even likeable. *Times Higher Education* 1891, 26-27.
- Herring, J. P. (1999). Key intelligence topics: a process to identify and define intelligence needs. *Competitive Intelligence Review* 10(2), 4-14.
- Herring, J. P. (2005). Create an intelligence program for current and future business needs. *Competitive Intelligence Magazine* 8(5), 20-27.
- Hisham Dzakiria. (2008). Pragmatic approach to qualitative case study research: a case of distance learning research in Malaysia. Sintok : Universiti Utara Malaysia Press, 331 p.
- Housego, S. & Parker, N. (2009). Positioning ePortfolios in an integrated curriculum. *Education + Training* 51(5/6), 408-421.
- Hughes, C.A. (2000). Information services for higher education. *D-Lib Magazine* 6(12). Retrieved online from <http://www.dlib.org/dlib/december00/hughes/12hughes.html> (accessed 27 May 2010).
- Hughes, S. & White, R. J. (2006). Competitive intelligence in higher education: opportunities and threats. *Academy of Educational Leadership Journal* 10(2), 67-81.
- Hunter, P. (2010). Data on the loose. *Engineering & Technology* 5(8) June.
- Karumanan, S. (2011). The 4 cornerstones of business excellence. *Management* 48(1), 37-39.
- Latchem, C. & Jung, I. (2010). Distance and blending learning in Asia. New York & London : Routledge, 266 p.
- Lazzari, M. (2009). Creative use of podcasting in higher education and its effect on competitive agency. *Computers & Education* 52, 27-34.
- Leech, N. L., Barrett, K. C. & Morgan, G. A. (2008). SPSS for intermediate statistics: use and interpretation (3rd ed.). New York : Lawrence Erlbaum Associates, 270 p.
- Lozano, R. (2011). The state of sustainability reporting in universities. *International Journal of Sustainability in Higher Education* 12(1), 67-78.
- Lukasiewicz, A. (2007). Exploring the role of digital academic libraries: changing student needs demand innovative service approach. *Library Review* 56(9), 821-827.
- Mashelkar, R. A. (2010). Innovation's holy grail. *Harvard Business Review* July-August 2010, 132-141.

- Merriitt, C. (1999). CI and the higher education dilemma. 2(4), October-December. Retrieved from <http://www.scip.org/Publications/CIMAArticle> (assessed 19 October 2010).
- Ministry of Higher Education (MOHE). Pusat Kecemerlangan Kementerian Pengajian Tinggi. Malaysia. Retrieved from <http://www.portal.mohe.gov.my/portal/page/>.
- Moore, M. M. & Tait, A. Eds. (2002). Open distance learning: trends, policy and strategy considerations. Paris : United Nations Educational, Scientific and Cultural Organization (UNESCO), 96 p. Retrieved from <http://unesdoc.unesco.org/images/0012/001284/128463e.pdf>
- Morales-del-Castillo, J. M., Pedraza-Jimenez, R., Ruiz, A., Peis, E. & Herrera-Videma, E. (2009). A semantic model of selective dissemination of information for digital libraries. *Information Technology Libraries*, March, 21-30.
- Murphy, D. & Yuen K. S. (1998). Asian research on open distance learning. International Research Foundation for Open Learning, Cambridge, UK. Retrieved from <http://www.irfol.ac.uk/publications/pdfs/asiarpt.pdf> (assessed 9 July 2010).
- Myburg, S. (2004). Competitive intelligence: bridging organizational boundaries. *The Information Management Journal* March/April, 46-55.
- Nitse, P. S. & Parker, K. R. (2003). Library science, knowledge management, competitive intelligence: archive theory – the common link. *The Reference Librarian*, 38(79 & 80), 395-407.
- Ojo, O. D. & Olakulein, F.K. (2006). The place of multiple intelligence in achieving the objectives and goals of open and distance learning institutions: a critical analysis. *Turkish Online Journal of Distance Education* 7(3).
- Oxford English Dictionary Online. Retrieved from <http://dictionary.oed.com> (assessed 9 July 2010).
- Parker, K. R., Nitse, P. S. & Flowers, K. A. (2005). Libraries as knowledge management centers. *Library Management* 29(4/5), 176-189.
- Pityana, N. B. (2009). Open distance learning in the developing world: trends, progress and challenges. Keynote speech presented on 23rd ICDE World Conference on Open Learning and Distance Education (7-10 June 2009, Maastricht, The Netherlands).
- Ralph, J. & Olsen, S. (2007). Podcasting as an educational building block in academic libraries. *Australian Academic & Research Libraries* 38(4), 270-279.
- Reddy, G. R. (ed). (1988). Open universities: the ivory towers thrown open. New Delhi :

- Sterling Publishers Private Limited, 270 p.
- Saeed, N., Yang, Y. & Sinnappan, S. (2009). Emerging web technologies in higher education: a case of incorporating blogs, podcasts and social bookmarks in a web programming course based on students' learning styles and technology preferences. *Educational Technology & Society* 12(4), 98–109.
- Streiner, D. L. & Norman, G. R. (2004). Health measurement scale : a practical guide to their development and use. England : Oxford University Press.
- The Chronicle of Higher Education. (2011). Open source in higher education: a sampling. Retrieved from <http://chronicle.com> (assessed 11 March 2011).
- The Free Dictionary. Retrieved from <http://www.thefreedictionary.com/capabilities> (assessed 9 July 2010).
- Viviers, W., Saayman, A. & Muller, M-L. (c2005). Competitive intelligence practices of South African firms. Potchefstroom University for CHE, Republic of South Africa.
- Wikipedia. List of largest universities by enrollment. Retrieved from http://en.wikipedia.org/wiki/List_of_largest_universities_by_enrollment (assessed 15 November 2010).
- Winzenried, A. (2009). Emerging technologies for academic libraries in the digital age. *Library Review* 58(6), 461-462.
- Wong, A., Lee, J. & Wu, C. (2006). Planning for operation: an e-service approach. Paper presented in Forum on Open Distance Learning (Open distance learning: revisiting planning and management) (20-25 February, Penang, Malaysia).

APPENDIX A

Table 2.2.1 List of 20 largest universities in Asia by enrollment

Rank	Institution	Location	Founded	Affiliation	Enrollment
1	Allama Iqbal Open University	Islamabad, Pakistan	1974	Public	1,806,214
2	Indira Gandhi National Open University	New Delhi, India	1985	Public	1,800,000
3	Islamic Azad University	Tehran, Iran	1982	Private	1,500,000
4	Anadolu University	Eskisehir, Turkey	1958	Public	884,081
5	Bangladesh National University	Gazipur, Bangladesh	1992	Public	800,000
6	Universitas Terbuka	Jakarta, Indonesia	1984	Public	646,467
7	Bangladesh Open University	Gazipur, Bangladesh	1992	Public	600,000
8	Ramkhamhaeng University	Bangkok, Thailand	1971	Public	525,000
9	University of Pune	Pune, India	1948	Public	496,531
10	University of the Punjab	Lahore, Pakistan	1882	Public	450,000
11	Dr. B. R. Ambedkar Open University	Andhra Pradesh, India	1982	Public	450,000
12	University of Delhi	New Delhi, India	1922	Public	400,000
13	Osmania University	Hyderabad, India	1918	Public	300,000
14	Yashwantrao Chavan Maharashtra Open University	Nashik, India	1989	Public	300,000
15	Tribhuvan University	Kirtipur, Nepal	1959	Public	290,833
16	Gujarat University	Ahmedabad, Gujarat, India	1949	Public	215,000
17	Korea National Open University	South Korea	1982	Public	210,978
18	Sukhothai Thammathirat Open University	Bangkok, Thailand	1978	Public	181,372
19	University of Karachi	Karachi, Pakistan	1951	Public	174,000
20	Cairo University	Giza, Egypt	1933	Public	155,000

(Source: Extracted from Wikipedia, assessed 15 November 2010)